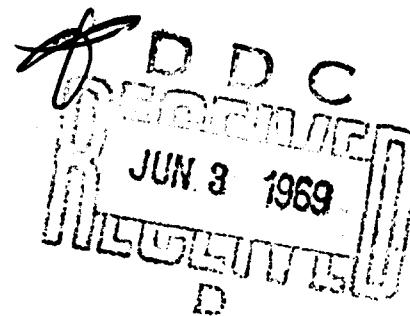


MINISTRY of TECHNOLOGY

Warren Spring Laboratory

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## Air Pollution Abstracts



March 1969

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Ministry of Technology  
**WARREN SPRING LABORATORY**

**AIR POLLUTION ABSTRACTS**

**March 1969**

1. General
2. Emissions and sources
3. Identification and measurement
4. Distribution (surveys, chimney heights, meteorology)
5. Effects on humans, animals, vegetation, etc
6. Administration (programmes, standards, legislation)
7. Methods and equipment for abatement
8. Miscellaneous

The original papers to which these abstracts and titles refer can in most instances be obtained through the local public library. In case of difficulty enquirers may refer to Warren Spring Laboratory. Only items marked (L) or with a five digit number prefaced by a letter are available in Warren Spring Laboratory Library.

Abstracts covering the whole field of fuel technology appear in "Fuel Abstracts and Current Titles" available on subscription from the Institute of Fuel.

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ACKNOWLEDGMENTS

In addition to original sources, the following abstracts journal has been used:

CIS Occupational Safety and Health Abstracts, International Labour Office, Geneva, 1968, vol. 6, no. 5

CORRIGENDUM

Air Pollution Abstracts November 1968:

Abstract A 11976: The last line was inadvertently omitted. The complete abstract is reproduced below:

**A 11976**

02030, 02416, 03331, 03409, 03668  
Ettinger, H.J., Moss, W.D. and Busey, H.

CHARACTERISTICS OF THE AEROSOL PRODUCED FROM BURNING PLUTONIUM

(APCA)

Proc. Ninth AEC Air Cleaning Conference, Boston, Mass., September 13-16, 1966. J. M. Morgan, Jr. and M. W. First (eds.), Washington, D. C., Atomic Energy Commission, 2, 905-27 (Jan. 1967). CFSTI: CONF 660001.

Size characteristics of the aerosol produced during plutonium fires were determined for different atmospheres ranging from 20.8% oxygen, 79.2% nitrogen to 0.5% oxygen, 99.5% nitrogen. Plutonium-cobalt-cerium alloy, and alpha- and delta-phase plutonium metal were burned. Data were obtained to estimate the fraction of plutonium alloy airborne during a plutonium fire. Fires simulating a reactor accident involving both fuel and coolant defined the relative airborne concentration of plutonium and sodium. The aerosol characteristics from burning plutonium-cobalt-cerium alloy (57.7% plutonium) and plutonium metal (alpha- and delta-phase) are summarized. Aerosol size was independent of oxygen concentration. The aerosol Count Mean Diameter (C.M.D.) produced from burning alpha- and delta-phase plutonium was somewhat smaller than that resulting from burning the alloy. The small particle size (C.M.D. of 0.02 to 0.09  $\mu$ ) shows that careful attention must be given to the design of air cleaning systems. The typical aerosol collected when plutonium alloy or metal was burned at four different oxygen concentrations is presented.

March 1969

# 1. General

A 12657 02030, 02045, 02047, 02205, 02320, 02386, 02788, 02861,  
03241, 03315, 03728, 03777, 04011; 02121, 02613; 02137,  
02921, 03423; 05180  
Gräfe, K.

AIR POLLUTION RESULTS AND PROBLEMS IN THE FEDERAL REPUBLIC OF GERMANY WITH  
CONSIDERATION OF DISTRICT HEATING  
Pub. Hith Insp., Nov. 1968, vol. 76, 648-661. (L)

Information on air pollution from different  
sources in the West German Federal Republic

is tabulated. SO<sub>2</sub> and dust did not increase  
parallel to emissions because of lower contents of  
sulphur in the oil, higher chimneys and better filters.

The amount of CO exceeds only in case of strong traffic  
and low wind-velocity the allowable concentration; the  
amount of aromatic polycyclic hydrocarbons as well as  
suspended particulate matter depend on the weather and  
the measuring points. Narrow networks for sedimented  
dust show even in small parks lower amounts than on  
neighbouring roads. Ozone is seldom higher than 5 ppm  
and not dangerous in Germany. Legislation and con-  
centration limits for the Federal Republic are discussed.  
Illustrated examples of district heating schemes in Ham-  
burg are given. The regulations for chimney heights are

(contd)

A 12657 (contd)

explained. Comparisons of measured SO<sub>2</sub>-concentra-  
tions with theoretical ones result in the possibility that  
the concentration at ground level can be forecast for  
settled weather situations. From the continuous SO<sub>2</sub>-  
measurements in Hamburg since 10 years decreasing  
averages and a map with SO<sub>2</sub>-wind-roses are demon-  
strated. SO<sub>2</sub>-wind-roses and a new method of recording  
SO<sub>2</sub> on a launch are a good help for finding great SO<sub>2</sub>-  
sources and for recommending further improvements.

A 12658 02040, 02214, 05017; 02043, 02139, 02140, 02461,  
02914, 02988, 03133, 03135, 03357, 03413, 03550,  
03555, 03777, 03880, 03962, 03990; 02060, 03800  
Kay, K.

LOOK AT THE FUTURE OF HAZARDOUS CONTAMINATION OF THE CIRCUMPOLAR ENVIRONMENT  
Arch. Envir. Hith, Oct. 1968, vol. 17, 653-661, 52 refs.

The air pollution problem in the arctic is reviewed, with reference to the  
literature. Gold-ore roasting in N.W. Canada gives rise to pollution by As<sub>2</sub>O<sub>3</sub>,  
with harmful effects on the adjacent town-site. Pesticides have been carried  
into the region by northeast trade winds. The likely future trends in air  
pollution in the arctic are indicated, with a note on arctic waste control,  
and a mention of the particular influence of prevailing meteorological con-  
ditions.

A 12659 02030, 02048  
McFarland, A.R.  
STATUS REPORT 1968: AEROSOL RESEARCH IN PROGRESS - INTRODUCTION  
J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 651. (L)

At the 1968 Air Pollution Control Association Annual Convention in  
St. Paul, status reports on aerosol research in progress were presented  
at a special technical session. Summaries of these reports are given in  
this issue of the APCA Journal (on p.652-696).

## 2. Emissions and sources

A 12660 02318, 02320, 02386, 02461, 02657, 02672, 02681, 02925,  
02960, 03137, 03526, 05810  
Hoffman, D.A. and Fitz, R.A.  
BATCH RETORT PYROLYSIS OF SOLID MUNICIPAL WASTES  
Envir. Sci. Technol., Nov. 1968, vol. 2, 1023-1026, 8 refs. (L)

Data collected from the pyrolysis of the combustible portion of a typical San Diego refuse demonstrate that, once started, the process can be sustained by the incineration of one or more of its products. This eliminates the purchase of additional fuel to maintain the process on a continuous basis.

Analysis of a sample of the evolved pyrolytic gases taken directly out of the gas stream immediately downstream of the gas meter shows these gases to be hydrogen, carbon dioxide, carbon monoxide, methane, ethane, and ethylene.

A 12661 02399, 02416; 02638, 02760, 03169, 03330; 05035  
Ramsden, A.R.  
APPLICATION OF ELECTRON MICROSCOPY TO THE STUDY OF PULVERIZED-COAL  
COMBUSTION AND FLY-ASH FORMATION  
J. Inst. Fuel, Dec. 1968, vol. 41, 451-454, 7 refs. (L)

A brief description is given of a probe and sampling technique for collecting particles from the gas stream of a pulverized-coal-fired test rig for direct examination by transmission electron microscopy. The technique is of value in studying the combustion of pulverized-coal particles and the formation of fly-ash. Initial experimental observations, made during combustion of some New South Wales bituminous coals, are presented.

This work forms part of a continuing investigation by the Coal Research Laboratory into various aspects of pulverized-coal combustion, including the formation, properties, and precipitation behaviour of fly-ash.

See also: A 12657, A 12658, A 12704, A 12710, A 12751, A 12761, A 12771

### 3. Identification and measurement

**A 12662** 02306, 02722, 03658, 03731  
Bailey, D.L.R. and Nicholson, H.L.  
SMOKE FILTER CALIBRATION CURVE: 1-cm Filter Holder  
Stevenage: Warren Spring Laboratory, Report LR 89(AP), Oct. 1968, 8 pp.;  
SER 900790 17 2.  
The calibration curve of standard smoke quoted in B.S. 1747 :  
Part 2 : 1964 is derived for a 2.54-cm filter holder. If the  
diameter of the stain is reduced whilst the air flow is held  
substantially constant the velocity of impact of the smoke  
particles on the filter paper is increased causing deeper  
penetration; hence an increased concentration per unit area is  
required to obtain a particular darkness index. This effect has  
been examined for a stain of 1-cm diameter and it was found  
that, over a range of smoke concentrations from 5 to 20  $\mu\text{g}/\text{m}^3$ ,  
the 2.54-cm calibration could be used with a multiplying  
factor of 1.30.

**A 12663** 02114, 02214, 02804  
British Scientific Instrument Research Association  
GAS ANALYSIS AND AIR POLLUTION  
Sira Abstracts and Reviews, 6 June 1968, vol. 23, 189-190, 23 refs. (L)

A literature survey.

**A 12664** 03312, 03315, 03354, 03869  
Bufalini, J.J.  
GAS PHASE TITRATION OF ATMOSPHERIC OZONE  
Environ. Sci. Technol., Sept. 1968, vol. 2, 703-704, 10 refs. (L)

Oxidant analyzers can be made specific for ozone by incorporating a small gas reaction chamber on the instrument. Ozone was selectively removed from a gas stream containing a variety of oxidants by gas titrating with *trans*-2-butene. Possible interferences from hydrogen peroxide, *n*-butyl hydroperoxide, peroxyacetyl nitrate, nitrogen dioxide, and peracetic acid are discussed.

**A 12665** 02009, 02036, 02441, 03512, 03658, 03775  
Debrun, G.  
CONTINUOUS "S.F." (SULPHUR-SMOKE) RECORDING APPARATUS, (APPAREIL "S.F." (SOUFRE-FUMÉES) ENREGISTREUR EN CONTINU). (In French; English summary)  
Pollut. Atmos., Apr.-June 1968, vol. 10, 81-87. (L)

The continuous sulphur-smoke recorder provides instantaneous information on the level of strong acidity (gaseous) in the air. The instrument incorporates a pH meter and uses sodium borate for measuring the level of acidity.

**A 12666** 02030, 02425, 03041, 03331, 03710; 03408, 03777  
Dennis, R. and Billings C.E.  
AEROSOL STUDIES AT GCA TECHNOLOGY DIVISION  
J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 687-688, 2 refs. (L)

Summarises studies relating to development of laser particle size analyser, ion microprobe mass spectrometer, particle sizing by mass decay curve analysis, and reactions of sulphur oxides in stack plumes (resulting in the loss of the  $\text{SO}_2$  from the atmosphere).

### 3. Identification and measurement

C2137, 02415, 02521, 02892, 03240, 03880, 03955  
**A 12667** Employment and Productivity, Department of (H.M. Factory  
Inspectorate)

METHODS FOR THE DETECTION OF TOXIC SUBSTANCES IN AIR - Booklet No. 11:

ANILINE VAPOUR

London: H.M.S.O., 1968, 12 pp., price 2s3d. (2nd edn.) (P 12356)

This booklet is a revised edition of the original test for aniline vapour published in 1939 and subsequently revised in 1959. Information on the toxicity of aniline vapour is followed by a description of the colorimetric test employed.

**A 12668** 02347, 03374, 03654, 03826, 03881, 03902  
Englert, R.D.

(SMOG TEST CHAMBER)

J. Air Pollut. Control Ass., Nov. 1968, vol. 18, 776-777. (L)

With demands for air pollution control increasing at all levels of government and among the general population, a new tool has been added to the arsenal in the fight against pollution. In a recent presentation before the American Society for Testing and Materials meeting in San Francisco, Dr. R. D. Englert of the Stanford Research Institute described a new smog test chamber constructed at the Institute's South Pasadena laboratories.

The chamber was constructed with funds provided by seven chemical (contd)

**A 12668** (contd)

companies and is now being used to conduct scientific tests on photochemical reactivity of trichloroethylene vapors.

**A 12669** 02692, 02997; 02464, 02478, 02613, 02629, 02790, 03330,  
03331, 03576; 03739

Flux, J.H., Smithson, D.J. and Smithson, R.N.

SIMPLIFIED DUST SAMPLING APPARATUS FOR USE IN IRON- AND STEELWORK

J. Iron Steel Inst., Dec. 1968, vol. 206, 1188-1193, 7 refs. (L)

A review article, dealing particularly with gas velocity and temperature measurements, dust loading determination, particle size and particle shape analysis, and particle counting (by means of the Coulter counter). Electron micrographs of dust particles sampled from electric-arc furnace fumes and hot-blast cupola fumes are presented.

**A 12670** 03192, 03312, 03780, 05880; 03471  
Anon.

CONTROL DISTRICT NEWS: CITY OF ALBUQUERQUE

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 704. (L)

The Air Management Division began regular measurement of atmospheric sulfation using the lead dioxide "sulfation plate" method. The sulfation plate monitors replace two sulfation candles which were not as sensitive and more difficult to prepare. Even though sulfur oxides are not important air contaminants in Bernalillo County, the division monitors at two stations (downtown Albuquerque and Nine-mile Hill) to determine background levels and any general changes.

Gas monitoring capability was increased with initiation of "oxidant" sampling. Mast Development Co. provided a continuous analysing instrument which operates on the coulombmetric principle.

### 3. Identification and measurement

A 12671 02030, 02048, 03380, 03576, 05820; 02625, 02722, 03120  
Fortner, E.J.

AEROSOL RESEARCH AT THE AMERICAN AIR FILTER COMPANY

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 670-671, 1 ref. (L)

Outlines the application of flame photometry (as used in the British Standard Sodium Chloride Test Procedure) in the determination of efficiency as a function of particle size characteristics of various types of impingement air filters including automatic renewable media, dry-type electronic, high-efficiency self-supported and high-efficiency pleated filters.

A 12672 02030, 02125, 03061, 03587; 03331  
Gucker, F.T., Osborne, E.C. and Tuma, J.

PHYSICO-CHEMICAL STUDIES OF AEROSOLS

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 664-665, 3 refs. (L)

Calculations of theoretical scattering curves for isotropic spheres of different refractive indices are set out and used to work out limits of their applicability in the determination of particulate concentration and size distribution by means of the technique of light scattering from individual aerosol particles.

A 12673 02030, 02046, 03041, 03061, 03587; 02030, 02164, 03331,  
Harris, F.S. and Sherman, G.C. 05814

LASER LIGHT SCATTERING AND AEROSOLS

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 659-660, 3 refs. (L)

Aerospace Corporation has a company-funded research program on atmospheric properties. The aim of this program is to obtain meteorologically useful information by studying aerosols through the use of optical techniques.

For the interpretation of atmospheric scattering measurements using laser light, it is necessary to know if classical scattering theory applies to laser radiation. Measurements on the angular distribution of intensity and polar-

ization of light scattered by latex hydrosols have shown there is no difference to be expected in the atmosphere between conventional and coherent laser light sources.

Rooftop and field measurements in the Los Angeles Basin are being made of the aerosol size distributions using a Royco 220 particle counter with a Technical Measurements Corporation Gamma scope II pulse height analyzer which gives simultaneous sizing in up to 100 channels.

A 12674 02372, 02804, 03120, 03283, 03710, 03881  
Krenz, R.

COMBINED GAS CHROMATOGRAPH-MASS SPECTROMETER FOR THE DETERMINATION OF ORGANIC GAS TRACES. (DIE KOMBINATION GASCHROMATOGRAPH-MASSENSPEKTROMETER ZUR BESTIMMUNG ORGANISCHER GASSPUREN). (In German; English summary)

Dechema-Monogr., 1968, vol. 62, 169-184, 30 refs. (L.)

The quantitative determination of unknown organic gas traces and gas impurities in inorganic gases at contents of 1 ppm or less at vapour pressures attaining say  $10^{-11}$  torr presents considerable difficulties. This paper gives the detection limits of the various measurement methods and shows how through ingenious combination of gas chromatograph and mass spectrometer this object of identifying and quantitatively determining organic gas traces can be attained. The determination of organic gas contents in minerals such as fluorspar and feldspars, which greatly affect the technological properties of these raw materials, is taken as an example. The possibility of continuous monitoring for works control is also discussed.

### 3. Identification and measurement

A 12675

02030, 02048, 02948, 03444, 03665; 02464, 02977, 03331,  
Lieberman, A. and Jackson, M.

03576, 03727

AEROSOL RESEARCH AT IIT RESEARCH INSTITUTE

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 660-661, 1 ref.

A program of research in Fine Particle Technology is carried out at the IIT Research Institute. This work includes research on Aerosol Technology which is supported by private industry, government agencies, and internal funding. Present research efforts in this area are in the general categories of Aerosol Physics and Instrument Development.

A stack sampling device is now being field tested. This device is capable of automatic isokinetic sample acquisition from stacks serving incinerators, power plants, or other installations where variable flow or wide particle size ranges may be encountered.

An imaging optical system analyzer is being developed to count and size airborne droplets and particles.

A 12676

02030, 02425, 02637, 02815, 03120, 03331, 03576, 03658  
Liu, B.Y.H.

AEROSOL RESEARCH: UNIVERSITY OF MINNESOTA PARTICLE TECHNOLOGY LABORATORY

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 694-695, 2 refs.

Studies are being conducted in the following fields: aerosol generation, aerosol particle size measurement, aerosol sampling, electrical charging of small particles, dynamic equilibrium in self-preserving aerosols, and aerosol formation.

A 12677

02030, 02464, 02613, 02653, 03120, 03331, 03587  
Martens, A.E.

ERRORS IN MEASUREMENT AND COUNTING OF PARTICLES USING LIGHT SCATTERING

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 661-663, 6 refs. (L)

Sources of sizing and counting errors are discussed.

A 12678

02030, 02157, 02441, 02446, 02521  
Mohnen, V.A. and Holtz, P.

THE SUNTA-ASRC AEROSOL DETECTOR

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 667-668. (L)

Describes an automatic, continuously operating aerosol counting system consisting essentially of two ionization chambers, namely the calibration chamber which is free of aerosols, and the measuring chamber through which the aerosol is carried with a slight air stream.

A 12679

02030, 02549, 02613, 03120, 03331, 03627, 04019; 02614  
Ober, M.

EVALUATION OF QUARTZ IN AIRBORNE DUST IN THE 0.5- TO 2-MICRON SIZE RANGE  
Envir. Sci. Technol., Oct. 1968, vol. 2, 795-798, 34 refs. (L)

A quantitative method is described by which the percentage of quartz in airborne dust is determined by x-ray diffraction. The method makes use of an Andersen dust sampler to separate the airborne dust into several aerodynamic particle size ranges of pathological interest. A laboratory dusting apparatus is described which is used for the preparation of a standard series and for the addition of the internal standard, calcium fluoride, of the same particle size range as the collected dust sample. The method provides information regarding the mass concentration in air, particle size distribution, per cent composition, and changes in per cent composition with size. The method makes use of membrane filters in the final analysis and is suitable for collected dust samples of 500 micrograms or greater.

### 3. Identification and measurement

A 12680 02030, 02048, 02164, 03279, 03331; 03061, 03587

Ogle, H.M.

PARTICLE COUNTING TECHNIQUES AVAILABLE FOR AEROSOL RESEARCH

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 657-659. (L)

Describes briefly, with illustrations, two types of instruments used for aerosol research. The first uses right angle scattering of light to count and size very small airborne particles. The second uses near-forward scattered light to accomplish a similar purpose but operates at much higher flow rates.

A 12681 02030, 02246, 02914, 03089, 03120, 03331

Palmes, E.D.

USE OF AEROSOLS TO MEASURE PULMONARY DIMENSIONS

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 671, 3 refs. (L)

Reports on studies relating to the development of an indirect method for the measurement of the effective size of the intrapulmonary gas spaces of normal subjects and of patients with chronic obstructive lung disease. The method depends on the rate of deposition of a monodisperse aerosol during breath holding, the subject being required to exhale a volume of gas twice as large as the volume of aerosol inhaled.

A 12682 02150, 02415, 02427, 03120, 02141, 03731

Polish Standards Committee

METHOD OF DETERMINING ATMOSPHERIC CONCENTRATIONS OF METHYL ALCOHOL (CIS)

PN-66/2-04038, Polish Standards

Committee (Pol. k. komitet normalizacyjny), Warsaw, 29 December 1966. Entry into force: 1 July 1967. Wydawnictwa normalizacyjne, Warsaw, 1967. 3 pp. Illus. Price: 2.40 Zluti.

The method described makes use of the oxidation of methyl alcohol with potassium permanganate in the presence of sulphuric acid to produce formaldehyde and the reaction of formaldehyde with chromotropic acid, followed colorimetric determination of the violet hue imparted to the sample. The method cannot be used in the presence of formaldehyde and methyl formate. The standard specifies the instruments and reagents to be used in the air sampling procedure, and the method of calculating the final results.

A 12683 02030, 02613, 02722, 02997, 03123, 03169, 03330, 03331,

Rutkowska, K. 03576

STUDY OF AEROSOLS COLLECTED ON MEMBRANE FILTERS WITH THE ELECTRON MICROSCOPE (CIS)

"Prace Centralnego Instytutu Ochrony Pracy", Warsaw, Poland, 1967, Vol. 17, No. 34, pp. 233-247. Illus. 11 bibli. refs.

Experiments were performed to determine the most appropriate method of preparing aerosol samples collected on membrane filters for examination with the electron microscope. The author describes conventional methods of dissolving the filter, from which a procedure was chosen in which the solvent is applied both in a standing and in a flowing layer. The required apparatus and working procedures are described. Measurement results using iron dust and mixed atmospheric dust are set out in tables. The preparations thus obtained display good transparency and contrast, permitting the observation of particles which are invisible under the optical microscope, identification of shape, size and to some extent structure being feasible.

A 12684 03331, 03600; 02214

Society for Analytical Chemistry

THE DETERMINATION OF PARTICLE SIZE. I. A CRITICAL REVIEW OF SEDIMENTATION METHODS

London. The Society, 1968, 42 pp., 157 refs.; price 30s. (P 12429)

This review forms part of a comprehensive survey of methods for determining particle size and the information presented has been collected by the Particle Size Analysis Sub-Committee of the Analytical Methods Committee of the Society for Analytical Chemistry.

The first stage of the Sub-Committee's work was to classify the various methods for determining particle size and this classification was published in 1963. As a second stage of the work, the various methods that were briefly described in the original classification are being reviewed in more detail. In the present publication most of the commonly used sedimentation methods of analysis have been considered.

### 3. Identification and measurement

**A 12685** 02320, 02521, 03710, 03861  
U.S. National Bureau of Standards  
ELECTRON SPECTROMETER DETECTS LOW CARBONMONOXIDE LEVELS  
Envir. Sci. Technol., Nov. 1968, vol. 2, 1000. (L)

Scientists at the National Bureau of Standards have found that the electron impact spectrometer, an instrument originally developed for atomic and particle physics research, may be a valuable tool for air pollution studies. An NBS group has already shown that the high-resolution, high-sensitivity instrument can detect, at the

part-per-million level, for example, the hard-to-distinguish gaseous contaminant, carbon monoxide. The full capabilities of the instrument in gas analysis are being studied in a joint program between NBS and the National Aeronautics and Space Administration's Langley Research Center.

**A 12686** 02427, 02516, 02613, 03025, 03120, 03169, 03576, 03607,  
03621; 02037, 03331  
Verein Deutscher Ingenieure  
VDI STANDARD 2266: MEASURING DUST CONCENTRATION AT THE PLACE OF WORK. (RICHTLINIE VDI 2266 "MESSUNG DER STAUBKONZENTRATION AM ARBEITSPLATZ"). (In German)  
Staub, Dec. 1968, vol. 28, 513. (L)

VDI Standard 2266 was published in August 1968 by Beuth-Vertrieb (Berlin and Cologne) in the form of two pamphlets dealing with particle number determination and entitled "Messen mit dem Thermalpräzipitator" (Measuring with the thermal precipitator) and "Messen mit dem Konimeter" (Measuring with the Konimeter). Sampling technique, and servicing and maintenance of the instruments used are described; the microscopic evaluation of the deposited dust is explained.

**A 12687** 02201, 03709, 03760  
Yakamoto, R.K. and Cook, W.A.  
DETERMINATION OF ETHYL BENZENE AND STYRENE IN AIR BY ULTRAVIOLET SPECTROPHOTOMETRY  
Amer. Ind. Hyg. Ass. J., May-June 1968, vol. 29, 238-241, 8 refs. (L)

In the production of styrene, it is important to be able to determine ethyl benzene and styrene in the presence of each other as an indication of sources of dispersion of vapors from the closed reaction system. The air is drawn at a fixed rate through a fritted-glass bubbler containing spectro-grade isooctane. The absorption of ultra-violet light at wavelengths of 268 m $\mu$  for the ethyl benzene and 291 m $\mu$  for the styrene is used as a measure of the amounts of these compounds collected from the air. This method has the advantages of sampling over a wide range of concentrations, of specificity, and of facility in both field and laboratory phases.

See also: A 12689, A 12693, A 12695, A 12700, A 12711, A 12713, A 12724, A 12725, A 12758, A 12759, A 12770, A 12771

## 4. Distribution (surveys, chimney heights, meteorology)

A1 2688 . 02049, 03658, 03777, 05500, 05610

Anon.

ATMOSPHERIC POLLUTION: THE STANDING CONFERENCE OF CO-OPERATING BODIES

Publ. Hlth Insp., July 1968, vol. 74, 453. (L)

The 70th meeting was held on 20th May 1968 at Church House, Westminster, and was attended by representatives of local authorities and officers from all over the country.

The report of the Committee to the Standing Conference showed that following the completion of the period for which the national survey was to run, there had been a slight decrease in the number of instruments operating. The Committee are anxious however that there should not be an undue decrease in the numbers maintained, as particularly in respect of many key sites, there is much useful information still to be gained.

A paper was presented by the laboratory staff on trends in ground level concentrations of smoke and sulphur dioxide. This showed that for sites outside London there has been a steady decrease in both smoke and sulphur dioxide over the past 15 years. In the London area however whilst smoke has shown a comparable decline, sulphur dioxide concentration

(contd)

A1 2688

(contd)

has been maintained at a similar level. Commenting upon the report, Dr. Hudson, medical officer of health, Dartford, drew a comparison between winter temperatures over the period covered by the report and produced a graph showing the correlation between fuel consumption over these years and the trends dealt with in the paper. Mrs. Weatherley, replying for the department, stated that there were similarities but did not feel that these were entirely conclusive.

A further paper was presented by Dr. Barker, medical officer of health, and Mr. Ismay, public health inspector of Southwick U.D.C., comparing the results from deposit gauge sites in Hove, Portslade and Southwick.

A1 2689 . 02030, 02170, 02578, 02642, 03041, 03120, 03331, 03406,  
03443, 03727, 04009; 03799

Anon.

PLANNING POLLUTION

Nature, Lond., 23 Nov. 1968, vol. 220, 733. (L)

The terms of last week's conference organized by the Royal Society assumed that the elimination of pollution at source was not yet a practical possibility, and most of the papers presented dealt with the measurement and theory of the diffusion of alien particles in the atmosphere. It was pointed out, however, that the advent of nuclear power on a large scale could well remove the need for a long-term solution to the pollution from power stations.

The contributors to the conference, drawn from Europe and North America as well as Britain, dealt with three specific aspects of pollution—measurement techniques, theories of plume rise and particle concentrations and a variety of more general problems about

(contd)

## 4. Distribution (surveys, chimney heights, meteorology)

### A 12689

the atmosphere and plant design. Several speakers referred to experiments carried out at Tilbury, where the plume emitted by the three power stations in the vicinity were used as subjects for study.

Among the contributions from the Central Electricity Research Laboratory at Leatherhead was a description of the use of a pulsed-light rangefinder (LIDAR)—based on the detection of the backscatter from a pulse of ruby laser light—to measure the concentrations and dimensions of chimney plumes at some distance from the stacks.

The most systematic analysis of the chimney stack problem came from Professor K. W. Klug of Darmstadt, who presented a flow chart of the assumptions required to calculate the distance and value of the maximum concentration of dirt from a plume. In another paper, Mr A. J. Clarke of the CEGB outlined in simple terms the pollution factors that must influence planners of power stations. It seems that the dirt concentration

### A 12689

(cont'd)

varies roughly as the rate of emission and inversely as the square of the height of emission, but overall decisions on chimney construction are still based on qualitative judgments.

### A 12690 02030, 02048, 02150, 03331, 03576 Beadle, R.W.

AEC SPONSORED LABORATORY WORK WITH AEROSOLS

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 690-691. (L)

The Fallout Studies Branch of the Division of Biology and Medicine is currently sponsoring aerosol research in several areas related to its fallout and atmospheric radioactivity programs. These studies are diverse in nature and, broadly, the objectives are:

1. Development and testing of aerosol sampling devices and technology,

and analytical techniques for sample analyses;

2. Increase the understanding of the mechanics of aerosol behavior and the role of aerosols in atmospheric processes contributing to the transport and deposition of nuclear debris;
3. Increase the knowledge of the chemistry and physics of the atmospheric aerosol.

### A 12691 02010, 02150, 02552, 03135 Berlyand, M.E.

THE BASIC PROBLEMS OF ATMOSPHERIC DIFFUSION AND AIR POLLUTION  
Glev. uprav. gidromet. sluz., 1967, 295-306.

National Lending Library for Science and Technology translation into English, Ref: 9022.551 (M.548) (NLL Translations Bulletin, Dec. 1968, p.1449).

### A 12692

02150, 02445, 02768  
Budilova, E.P. and Lensin, V.T.

ON FORECASTING THE INTENSITY OF ATMOSPHERIC CONVECTION BY THE LAYER METHOD  
Tr. glev. geofiz. observ., 1967, vol. 202, 72-85.

National Lending Library for Science and Technology translation into English, Ref: 9022.551 (M.549) (NLL Translations Bulletin, Dec. 1968, p.1449)

## 4. Distribution (surveys, chimney heights, meteorology)

A 12693 02030, 02048, 03061, 03919, 03976; 02386, 03192, 03658;  
charlson, R.J. 05296, 05960

ATMOSPHERIC AEROSOL RESEARCH AT THE UNIVERSITY OF WASHINGTON

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 652-654, 10 refs. (L)

This research has centered on the problem of the relationship of aerosol properties and the visibility in the atmosphere. The integrating nephelometer has been adapted for specific applications such as monitoring the light-scattering coefficient as a function of time in a stationary location, study of forest aerosols and the effect of smoke thereon, and monitoring the aerosol 'background' in air entering the Pacific Northwest.

A 12694 02030, 02048, 02516, 02552, 03135, 03444, 03492, 03882  
Engelmann, R.J.

AEC SPONSORED AEROSOL WORK IN THE OUTDOORS

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 656-657. (L)

Field aerosol work sponsored by the (U.S.) Atomic Energy Commission is summarised. Radioactive tracer techniques are employed in some of these studies which are predominantly concerned with atmospheric diffusion, dry deposition, and precipitation scavenging.

A 12695 02030, 02048, 02394, 02411, 02425, 03599  
Gieseke, J.A.

AEROSOL RESEARCH AT BATTELLE-COLUMBUS: SETTLING OF AEROSOL CLOUDS

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 682-684, 9 refs. (L)

Concentrated clouds of aerosols are encountered in many practical situations and sometimes occur in nature. The behavior of these aerosol clouds is often not consistent with the usual single-particle analysis of aerosol systems. The effect of aerosol concentration on sedimentation of aerosol clouds has been considered in this study.

A 12696 02150, 03135, 03315  
Guscin, G.P.

ON ATMOSPHERIC OZONE

Glav. uprav. gidromet. gluz., 1967, 207-210.

National Lending Library for Science and Technology translation into English, Ref: 9022.551 (M.547) (NLL Translations Bulletin, Dec. 1968, p.1449)

A 12697 02030, 02035, 02048, 02411, 02637, 02638, 03599; 02516  
Hidy, G.M. et al.

AEROSOL COAGULATION AND PARTICLE SCAVENGING BY DROPS OR FIBERS

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 682, 5 refs. (L)

Briefly outlines work done at the National Center for Atmospheric Research (Boulder, Colorado). Main topics of the studies are the collision and coagulation processes in aerosols, and the deposition of charged aerosols on a cylindrical fibre in a uniform electrical field.

## 4. Distribution (surveys, chimney heights, meteorology)

A 12698 02137, 02201, 02372, 02682, 02921, 02964, 03201, 03243,  
03374, 03697, 03873, 04021, 05814

Lonneman, W.A., Bellar, T.A. and Altshuller, A.P.

AROMATIC HYDROCARBONS IN THE ATMOSPHERE OF THE LOS ANGELES BASIN  
Envir. Sci. Technol., Nov. 1968, vol. 2, 1017-1020, 20 refs. (L)

Gas chromatographic analyses for aromatic hydrocarbons were made in Los Angeles during the fall of 1966. A concentration technique permits analysis for hydrocarbons ranging from benzene to 10-carbon aromatics. These measurements make it possible to relate the levels of aromatic hydrocarbons to atmospheric photochemical reactivity. Concentrations of aromatics averaged 0.106 p.p.m. during this period; the maximum concentration was 0.33 p.p.m. Toluene, the most abundant aromatic hydrocarbon, constituted 35 to 40% of the total concentration of aromatics. The more reactive dialkyl- and trialkylbenzenes constituted 40% of the aromatics measured. Ratios of many of the aromatic hydrocarbons to each other varied considerably within the same day as well as on different days. Analysis of the ratios suggested a significant contribution from solvent losses. Ratios of hydrocarbon to nitrogen oxides were consistent with the observed oxidant concentrations.

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A 12698 (contd)

bons to each other varied considerably within the same day as well as on different days. Analysis of the ratios suggested a significant contribution from solvent losses. Ratios of hydrocarbon to nitrogen oxides were consistent with the observed oxidant concentrations.

A 12699 04009, 05560  
Meteorological Office

TABLES OF SURFACE WIND SPEED AND DIRECTION OVER THE UNITED KINGDOM  
London: H.M.S.O., 1968, Met. O. 792, 326 pp., price £2.10s. (P 12474)

These tables replace 'Tables of Wind Direction and Force over the British Isles' (second edition with supplements: issued in 1943 by the Meteorological in typescript form).

A 12700 02030, 02048, 03120, 03135, 03161, 03351, 03777, 05874  
Peterson, C.M.

MEASURING AND RELATING ATMOSPHERIC POLLUTION TO METEOROLOGICAL PARAMETERS  
J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 654-655. (L)

Aerosol research at the School of Public Health, University of Minnesota is focused on the analysis and relationship of gaseous, particulate, biological, and meteorological data obtained from instruments located on and adjacent to a local television tower. The self-supporting tower is situated on the boundary line between Minneapolis and St. Paul where the area is typically mixed residential, industrial, and commercial. Mounted directly on the tower are thermohums, aerovanes, a bivane, and a one-inch conduit. A thermohum and an aerovane are located at 70, 170, and 500 feet respectively above ground level

and provide current temperature, temperature difference, wind speed, and wind direction information.

Meteorological data is used extensively in all phases of this research to relate variations in particle concentrations measured, sulfate and SO<sub>2</sub> values determined, biological counts, and ion quantities to meteorological conditions. The ability to relate meteorological parameters to air pollution potential may lead to the development of better forecasting conditions as the basis for voluntary control of contaminant discharges or the invocation of regulatory and precautionary measures.

## 4. Distribution (surveys, chimney heights, meteorology)

A 12701 02030, 02048, 02114, 02119, 02914

Schwendiman, L.C.

AN OUTLINE OF RESEARCH AT PACIFIC NORTHWEST LABORATORY RELATED TO AIRBORNE PARTICLES

J. Air Pollut. Control Ass., Oct 1968, vol. 18, 679-680, 2 refs. (L)

The main fields of studies are in physics, atmospheric sciences, life sciences (inhalation etc. of particles), and analytical techniques.

A 12702 02030, 02850, 03331, 03492, 03856

Storebø, P., Madelane, G. and Bricard, J.

STUDY OF THE RADIOACTIVITY LOCATED ON AEROSOLS OF OVER 0.25  $\mu$  RADIUS AT GROUND LEVEL. (ETUDE DE LA RADIOACTIVITE LOCALISEE SUR LES AEROSOLS AU NIVEAU DU SOL DE RAYON SUPERIEUR A 0.25  $\mu$ ). (In French; English summary)

Ann. Occup. Hyg., Oct. 1968, vol. 11, (4), 295-298, 5 refs. (L)

It has been proved, by direct measurement, that the radioactivity attached to atmospheric particles over 0.25  $\mu$  radius, at ground level, may reach 60 per cent of the total radioactivity on natural aerosols; the distribution of natural radioactivity over particle size cannot be deduced from measurements which involve previous artificial enrichment with thoron.

A 12703 02030, 02084, 02300, 02353, 02375, 02915, 02921, 03000,

03063, 03374, 03509, 03777

Urone, P. et al.

STATIC STUDIES OF SULFUR DIOXIDE REACTIONS IN AIR

Envir. Sci. Technol., vol. 2, Aug. 1968, 611-618, 13 refs. (L)

In the presence of metal oxides, sulfur dioxide in air at concentrations between 8 and 27 p.p.m. reacts with other airborne pollutants such as saturated and unsaturated hydrocarbons, nitrogen dioxide, and others within minutes, both in the presence and absence of sunlight.

In the presence of water vapor, the rate of photochemical reaction of sulfur dioxide in the air under UV is 0.1% per hour. When hydrocarbons and nitrogen dioxide are present, the rate of the reaction is of the order of a few per cent per hour.

See also: A 12657, A 12658, A 12666, A 12673, A 12679, A 12701, A 12770

## 5. Effects on humans, animals, vegetation, etc

A 12704

02891, 02964, 03357, 03799, 03962; 02416, 03526, 03658

Brady, N.C. (ed.)

AGRICULTURE AND THE QUALITY OF OUR ENVIRONMENT

Washington: American Association for the Advancement of Science, 1967, 460 pp.,  
price \$11.50.

(Envir. Sci. Technol., Nov. 1968, vol. 2, 1046-1047: Review by J.F. Lutz)

Essentially, the book presents the transactions of a symposium conducted in December 1966 by the Section on Agriculture (O) of the American Association for the Advancement of Science. The symposium was cosponsored by the American Society of Agronomy, American Society of Animal Science, American Society of Plant Physiologists, Entomological Society of America, Poultry Science As-

sociation, Society of American Foresters, and the Soil Conservation Society of America.

One section, "Agriculture and Air Quality," presents 10 papers dealing with the physical, chemical, and biological interrelations of air in plant and animal growth. The sources, amounts, effects, and economic importance of various contaminants are discussed. While many of the air contaminants

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A 12704

(contd)

are derived from industrial activities, some are derived from agricultural practices—among these are pesticides and other agricultural chemicals lost to the air by vaporization; dust resulting

mainly from improper land use; and smoke containing numerous gases that result from the burning of agricultural wastes.

(The book is also reviewed by A.N. Duckham in Nature, 13 July 1968, vol. 219, 206-207).

A 12705

02214, 02458; 02030, 02094, 02359, 02399, 02400, 02613,  
02614, 02915, 02970, 02997, 03133, 03186, 03574, 03739,  
03777, 03780, 03818, 03909; 02150, 03000

Evans, U.R.

THE CORROSION AND OXIDATION OF METALS, First Supplementary Volume

London: Edward Arnold, 1968, 488 pp., £6 10s. (L 99525)

This book contains the following two chapters: Atmospheric Corrosion (p. 185 - p. 204, with numerous references) dealing with, *inter alia*, ammonium salts as cause of corrosion, emission of sulphur compounds by the burning of coal, effect of solid particles, correlation between SO<sub>2</sub> consumption and corrosion rate, corrosion by salt deposits and under different climatic conditions, exposure of ornamental iron in Great Britain, importance of chloride in atmospheric attack, and use of corrosion inhibitors; and Electrochemical Mechanism of Atmospheric Rusting (p. 369 - p. 374, 22 refs.).

A 12706

03315, 03417, 03871

Feder, W.A.

REDUCTION IN TOBACCO POLLEN GERMINATION AND TUBE ELONGATION, INDUCED BY LOW LEVELS OF OZONE

Science, 7 June 1968, vol. 160, 1122, 1 ref. (L)

Pollen of the ozone-sensitive tobacco variety Bel W-3 undergoes a reduction in germination rate and tube elongation when exposed to ozone. As little as 0.1 part of ozone per million for a 3.5-hour exposure period is sufficient to cause a 40 to 50 percent reduction in germination and a 50 percent reduction in pollen-tube elongation. Ozone causes these effects to approximately the same degree whether the pollen is exposed to ozone *in vitro* or agar disks, or *in vivo* when the intact plant is exposed. Exposure to ozone at a concentration of 1.0 part per million for more than 3 hours *in vitro* completely prevents germination of Bel W-3 pollen.

## 5. Effects on humans, animals, vegetation, etc

**A 12707** 02516, 03046, 03057, 03419, 03500, 03962  
Francis, C.W., Chesters, C. and Erhardt, W.H.  
<sup>210</sup>POLONIUM ENTRY INTO PLANTS

Envir. Sci. Technol., Sept. 1968, vol. 2, 690-695, 16 refs. (L)

The possibility that root uptake of <sup>210</sup>Pb from soils is the principal mechanism of <sup>210</sup>Po entry into plants was evaluated and proved to be invalid. If the <sup>210</sup>Pb in the plant is not soil-derived, the second most likely source is natural radioactive fallout, of which the most important component is from rainfall. Material balances of the quantities of <sup>210</sup>Pb in tobacco over time intervals of known rainfall indicate rains deposit approximately twice as much <sup>210</sup>Pb as observed in tobacco leaves, verifying the hypothesis that deposition of <sup>210</sup>Pb by rainfall is the principal mechanism of <sup>210</sup>Po entry in plants.

**A 12708** 02914, 03315  
Hore, T. and Gibson, D.E.  
OZONE EXPOSURE AND INTELLIGENCE TESTS  
Arch. Envir. Hlth., July 1968, vol. 17, 77-79, 15 refs. (L)

The effect of ozone on mental functioning was studied by administering intelligence tests to 99 university students. The subjects were divided into treatment (exposed to 0.2 to 0.3 ppm ozone during the writing of the test), placebo, and control (not exposed to ozone) groups. After statistical adjustment had been made for the effects of the covariants (age, sex, anxiety, and initial intelligence test score) no significant difference was found between the groups. This study indicated that exposure to concentrations of 0.2 to 0.3 ppm ozone over a period of 70 minutes had no noticeable effect on mental functioning during the exposure period.

02030, 02119, 02246, 02516, 02914, 03539, 03542, 03777,  
**A 12709** 03871, 03882  
Lippmann, M. and Albert, R.E.  
USE OF MONODISPERSE AEROSOLS FOR STUDIES ON RESPIRATORY TRACT DEPOSITION AND CLEARANCE  
J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 672-674, 9 refs. (L)

Reports on a systematic study which is being conducted at the New York University Institute of Environmental Medicine laboratories in relation to the factors affecting the regional deposition of inhaled aerosols.

02066, 02080, 02299, 02613, 02683, 02692, 02929, 02941,  
**A 12710** 03361, 03658, 03947, 03962, 05160  
Martin, J.-F. and Jacquard, F.

INFLUENCE OF FACTORY SMOKE ON THE DISTRIBUTION OF LICHENS IN THE ROMANCHE (ISÈRE) VALLEY, (INFLUENCE DES FUMÉES D'USINES SUR LA DISTRIBUTION DES LICHENS DANS LA VALLEE DE LA ROMANCHE (ISÈRE)). (In French: English summary)  
Pollut. Atmos., Apr.-June 1968, vol. 10, 95-99, 14 refs. (L)

In the industrial part of the valley, pH measurements indicate considerable pollution of lower air layers by basic dust. At Séchilienne, the smoke from the calcium carbide plant has profoundly altered the flora: some lichens are completely absent in the highly polluted areas, while others are abnormally plentiful. Near the aluminium works in Riond'Albion, the scarcity of lichens is very marked in some places. Hydrofluoric acid is implicated as at least partly responsible for the ill-effects on lichens.

## 5. Effects on humans, animals, vegetation, etc

**A 12711** 02967, 03057, 03377, 03391, 03658, 03777, 03898, 04036,  
Pollanschutz, J. 05050  
FIRST RESULTS OF THE APPLICATION OF AN INFRARED COLOUR FILM IN AUSTRIA FOR  
THE PURPOSE OF DETERMINATION OF SMOKE DAMAGE. (ERSTE ERGEBNISSE ÜBER DIE  
VERWENDUNG EINES INFRAROT-FARBFILMES IN ÖSTERREICH FÜR DIE ZWECKE DER RAUCH-  
SCHADENFESTSTELLUNG). (In German; English translation: Mintech Trans. T6150)  
Zentbl. Ges. Forstw., 1968, vol. 85, (2), 65-79, 6 refs. (P 12224)

Aerial infrared photography was used to record air pollution damage produced on trees by smoke (particularly  $SO_2$ ). The method is based on changes in infrared reflectivity produced in the plants as a result of air pollution damage, and on the colour effects produced by these changes in the special infrared-sensitive colour film (Kodak Ektachrome Infrared Aerofilm) employed.

**A 12712** 02143, 02914, 03000, 03089, 03264, 03330  
Stumpfius, J. and Meyer, P.B.  
ASBESTOS BODIES AND MESOTHELIOMA  
Ann. Occup. Hyg., Oct. 1968, vol. 11, (4), 283-293, 26 refs. (L)

The relation between exposure to asbestos and the occurrence of neoplasia is reviewed and it is concluded that the increasing use of asbestos will result in an increasing incidence of tumours. It is known that inhalation of asbestos fibres results in the formation of asbestos bodies in the lungs.

Typical asbestos initiated tumours—pleural and peritoneal mesothelioma—were found at an unusually high frequency in shipyard-workers. Only slight asbestos exposure had taken place in these cases. On the other hand the persons involved had been exposed to high concentrations of iron oxide (flame cutters and welders). Objects similar to asbestos bodies were found in their lungs. Originally it was thought that these were pseudo asbestos bodies, containing an iron oxide core, and it was suspected that pseudo asbestos bodies might play a part in the genesis of the tumours. Investigations carried out at TNO institutes showed that the kernel of the bodies contained asbestos of the amphibole type thus proving that they were not pseudo but normal asbestos bodies. The simultaneous exposure to low concentrations of asbestos and high concentrations of iron oxide raises the suspicion that iron oxide might be an important cofactor in the genesis of mesothelioma found in the shipyard-workers. Experiments with different types of asbestos and iron oxide, on animals, are considered to be highly desirable in order to verify or disprove this hypothesis.

**A 12713** 02030, 02048, 02722, 02914, 03492  
Thomas, J.W.  
AEROSOL RESEARCH ACTIVITIES AT THE HEALTH AND SAFETY LABORATORY, U.S. ATOMIC  
ENERGY COMMISSION - 1968  
J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 685-687, 6 refs. (L)

Two current projects utilise monodispersed aerosols of known charge and density. These projects are a study of filtration of aerosols by Whatman 41, Type 5G, and 11PC 1478 filter papers, and a recalibration of size-selective samplers. Other current projects are generation and measurement of aerosols under 0.1 micron diameter, the diffusion rate of the radium A atomic aerosol, and the respiratory deposition of radon daughter.

**A 12714** 02119, 02336, 03871, 03880  
Weiss, W.  
CIGARETTE SMOKE GAS PHASE AND PNEUMONIA SURVIVAL  
Arch. Envir. Health, July 1968, vol. 17, 62-64, 3 refs. (L)

The effect of cigarette smoke gas phase on the survival time of *Paramecium aurelia* was studied with an intermittent method of exposure. This method simulated human smoking and revealed the ability of activated charcoal to reduce the toxic effect of gas phase.

## 5. Effects on humans, animals, vegetation, etc

A 12715 02143, 02311, 02613, 02648, 03089, 03178, 03731, 03799  
Whipple, H.E. (Ed.)

02214

BIOLOGICAL EFFECTS OF ASBESTOS  
(C18)

"Annals of the New York  
Academy of Sciences", New York, USA, 31 December 1968, Vol. 133, Art. 1, pp. 1-  
766. Illus. 815 bibli. refs.

Proceedings of an international conference which took place at the New York Academy of Sciences on 19-21 October 1964. The various sections reproduce papers and discussions on: (I) Asbestos materials in modern technology; (II) Lung tissue and mineral matter - Problems of pathogenesis; (III) Human exposure to asbestos - Industrial populations; (IV) Human exposure to asbestos - Community studies; (V) Human exposure to asbestos - Dust controls and standards; (VI) Clinical studies of pulmonary asbestos; (VII) Asbestos and neoplasia - Experimental; (VIII) Asbestos and neoplasia - Epidemiology; (IX) Asbestos and neoplasia - Diffuse mesothelial tumours; (X) Problems and perspectives. Three appendices are devoted to: (1) Report and recommendations of the Working Group on Asbestos and Cancer of the International Union Against Cancer (UICC); (2) Dust diseases and workmen's compensation in the USA; and (3) Statistical tables - Asbestos production in the world.

A 12716 02199, 02320, 03046, 03315, 03555  
Xintaras, C.

BEHAVIOURAL TOXICOLOGY LOOKS AT AIR POLLUTANTS  
Envir. Sci. Technol., Oct. 1968, vol. 2, 731-733. (L)

Reports on studies carried out at the National Air Pollution Control Administration's behavioural toxicology unit in Cincinnati in connection with the effect of certain pollutants on the processing of information by the brains of rats and monkeys. Carbon monoxide, ozone and lead were the pollutants investigated.

See also: A 12667, A 12681, A 12693, A 12701, A 12725

## 6. Administration (programmes, standards, legislation)

A 12717 02044, 05550, 05660, 05680, 05695

Anon.

SMOKE CONTROL AREAS: Progress Report

Smokeless Air, summer 1968, vol. 38, (146), 263. (L)

The position, in terms of totals in England, Wales, Scotland and Northern Ireland, as at 31 March 1968, is listed, and a summary of progress in England is presented in tabular form, arranged by regions, as at 31 March 1968.

A 12718 02044, 05500

Anon.

NEW SMOKE CONTROL ORDERS

Smokeless Air, summer 1968, vol. 38, (146), 264-265. (L)

Gives a status report up to 1 April 1968. Areas affected are listed.

A 12719 02048, 03471, 05510

Anon.

THE CENTRE FOR ENVIRONMENTAL STUDIES

Publ. Hlth Insp., July 1968, vol. 76, 454. (L)

The Centre for Environmental Studies began its work in April 1967. It is an independent body financed jointly by the Ford Foundation and the British Government, with the aim of advancing education and research in the planning and design of the physical environment.

Initially, the Centre's activities will be in three main areas: research, confrontation and information. The main part of the Centre's funds will be channelled to university departments and to other suitable institutions in support of specific research projects. In addition the Centre is forming its own research team.

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A 12719 (cont'd)

Part of the Centre's work will involve the circulation of news about current planning research and its own activities.

It is hoped that the Centre for Environmental Studies will become a significant international and European meeting place where experience from many countries may be shared and where overseas researchers may base themselves.

A 12720 02047, 02461, 03654, 03697, 05814, 05816; 02921, 03201, 03697, 05850

Anon.

RULE 66 REVISITED: INDUSTRY MAKES IT WORK

Chem. Week, 6 July, 1968, vol. 103, 14-15. (L)

Only a preliminary appraisal of the regulations' effectiveness has been possible. But the APCD officials contend some side benefits are already apparent: reclamation of what would otherwise be wasted process heat; improved degreasing techniques; and in some instances, better products.

This has been done at some cost. Makers of solvents, resins and products containing organic

solvents estimate they have spent more than \$1 million for research, reformulation and pollution-control equipment to comply with the law.

In its first year, Los Angeles' famous Rule 66 limiting use of photochemically reactive organic solvents is credited by the Los Angeles County Air Pollution Control District (APCD) with having measurably reduced smog-causing emissions.

## 6. Administration (programmes, standards, legislation)

A 12721 02042, 05600  
Anon.

ENVIRONMENTAL HYGIENE IS U.S. ARMY MISSION  
Envir. Sci. Technol., Sept. 1968, vol. 2, 669-671. (L)

Outlines the origin and functions of the U.S. Army Environmental Hygiene Agency, whose mission is said to consist in monitoring the health aspects of environmental pollution within the Army and coordinating abatement policy with the Chief of Engineers.

A 12722 02045, 05070; 02964, 03777; 02692, 02714, 02752  
Anon.

SPECIAL REPORT ON POLLUTION: MORE LAWS ARE COMING TO HALT POLLUTION  
Can. Chem. Process., Oct. 1968, vol. 52, 60-64. (L)

Feature article, dealing with both water and air pollution. The air pollution problem in Canada is reviewed, and current legislative situation is outlined; the trend towards the imposition of tougher standards is noted.

A 12723 02045; 02320, 02602, 02921, 03201, 03359, 03731, 03955,  
Anon. 05810

LEGISLATIVE BRIEFS: CALIFORNIA  
J. Air Pollut. Control Ass., Nov. 1968, vol. 18, 766. (L)

The California Legislature has passed, and Governor Reagan has signed, a bill called by its author, Assemblyman John Foran of San Francisco, "the toughest anti-smog piece of legislation ever to be introduced or passed in any state... or by the federal government."

The bill sets standards that must be met by automobile manufacturers before their cars may be sold or licensed in California.

The 1960 standard for California for vehicles greater than 6000 lb (Hydrocarbon, 275 ppm, CO 1.5%) is the same as the federal, but the federal standards will not go into effect until 1970. Similarly, the California fuel evaporation standard applies in 1970, while federal standard does not begin until 1971.

02047, 02237, 02613, 02642, 02795, 02849, 03120, 03331,  
A 12724 Beighton, J. 05510

GRIT AND DUST: with Particular reference to the Working Party Report  
Smokeless Air, summer 1968, vol. 38, (146), 266-269. (L)

Discusses selected items from the report, published in 1967, by the Ministry of Housing and Local Government working party on grit and dust emissions, set up in 1964. These items include terms of reference of the working party, definitions, and limitations affecting the execution of grit and dust emission measurements which may need to be carried out under the Clean Air Act of 1956.

A 12725 02143, 02164, 02613, 03576, 03731, 05500  
British Occupational Hygiene Society

HYGIENE STANDARDS FOR CHrysotile ASBESTOS DUST  
Oxford: Pergamon Press, June 1968, 26 pp., 15 refs.; 10s. (P 12128)

These Standards are subject to revision in three years. Recommendations on their use are given. Types of asbestos, sampling methods and instruments, and counting techniques are described.

## 6. Administration (programmes, standards, legislation)

A 12726 02042, 02043, 02046, 02399, 02788, 02964, 03658, 03777,  
04009, 05680

Christie, J.

THE PROBLEMS OF SMOKE CONTROL

Smokeless Air, summer 1968, vol. 38, (146), 257-262. (L)

Discusses the factors that have to be considered before a smoke control programme is instigated, principally the Development Area policy, and the prevailing winds. Related topics include problems arising from the indiscriminate sale of bituminous coal in the Glasgow area (with which the author is particularly concerned), prosecutions under the clean air programme, and the nature of the problem of pollution from industrial sites.

A 12727 0204, 02045, 02237, 02461, 02833, 02881, 03471, 03658,  
05660

Fleming, W.L.

INTRODUCING A SMOKE CONTROL AREA

Publ. Hlth Insp., July 1968, vol. 76, 447-453, 7 refs. (L)

Reports on the establishment of No. 1 Smoke Control Area by Castlereagh Council, in Dundonald, Northern Ireland, pursuant to Sections 11-16 of the Northern Ireland Clean Air Act of 1964. Experiences gained in the execution of this pilot scheme, and conclusions drawn therefrom, are set out.

A 12728 02030, 02045, 02214, 02638, 02642, 02688, 02921, 03731,  
05800; 05977; 05400; 05500

Grundy, R.D.

RATIONALE FOR AIR QUALITY CRITERIA

Envir. Sci. Technol., Oct. 1968, vol. 2, 742-749, 17 refs. (L)

Discusses the development of air quality criteria in the U.S. and their function in the formulation of air quality standards, with particular reference to the implications of the Air Quality Act (1967). The importance of setting standards that are attainable at the given time, and of revising them to keep pace with the advance in technology, is emphasized. Information is appended on the World Health Organisation, Russian, and British approaches to the development and formulation of air quality criteria.

A 12729 0204, 02045, 03443, 05340

Latsky, C.E.

REPORT FROM SOUTH AFRICA

Smokeless Air, summer 1968, vol. 38, (146), 250-251. (L)

Reports on the implementation of the Atmospheric Pollution Prevention Act in South Africa, and on the national air pollution conference at Cape Town in Oct. 1967, when the formation of a national association for clean air in South Africa was proposed.

A 12730 0204, 02461, 05800; 03799

McKee, H.

POLLUTED AIR: A TAXING PROBLEM

Chem. Week, 6 July 1968, vol. 103, 35. (L)

Special tax benefits—already offered in 22 states to help industry bear the projected \$23-billion burden of pollution abatement costs in the next five years—were criticized last week at the Air Pollution Control Assn.'s 61st annual meeting.

McKee — a 48-year-old Ph.D. chemical engineer who formerly worked for Jefferson Chemical Co. — suggested that tax relief for installation of pollution control

equipment be granted only to existing plants, only for equipment actually needed to conform to new pollution control standards, and only if the equipment is installed within a specified (and not too lengthy) time.

## 6. Administration (programmes, standards, legislation)

A 12731 02043, 02045, 02898, 03201, 03777, 05510

Marsh, A.

RETROSPECT AND PROSPECT: An Address to the Annual Conference of the Scottish Division of the National Society for Clean Air, 23 May 1968  
Smokeless Air, summer 1968, vol. 38, (146), 238-243. (L)

A review of the history of the National Society for Clean Air, and its functions and activities, and of legislation with which it has been particularly associated, is followed by an outline of postwar advances and further prospects for progress in the clean-air field.

A 12732 02040, 02045, 02386, 05800

Middleton, J.T.

THE AIR QUALITY ACT OF 1967 - A CHALLENGE TO THE SCIENTIST  
Washington: U.S. Department of Health, Education, and Welfare, Public Health Service, 1968, 9 pp. (P 11616)

Paper presented to the Chemical Society of Washington, 11 Jan. 1968, in which attention is drawn to the challenge presented to the scientist by the passage of the Air Quality Act, 1967, especially in view of the aggravation of the air pollution problem due to the population expansion and increasing urbanisation which are taking place now.

A 12733 02030, 02042, 02320, 02646, 02201, 03243, 03312, 03654,  
03731, 03779, 05880

Middleton, J.T.

MIDDLETON TALKS ABOUT... (AIR POLLUTION CONTROL AND CRITERIA)  
Envir. Sci. Technol., Oct. 1968, vol. 2, 734-737. (L)

The views of J.T. Middleton, Commissioner of the National Air Pollution Control Administration, on air quality criteria, air pollution control technology, and control programmes in the U.S. The need for national coordination of the work of federal air pollution agencies is stressed.

A 12734 02043, 02044, 02461, 02580, 02613, 02849, 02960, 03526

National Society for Clean Air

REFUSE DISPOSAL: NSCA MEMORANDUM

Smokeless Air, summer 1968, vol. 38, (146), 234-235. (L)

Gives the text of a memorandum submitted by the Society to the Working Party on Refuse Disposal set up by the Ministry of Housing and Local Government, in which particular attention is drawn to the need for eliminating the burning of refuse by householders and small industrial undertakings, and for closely controlling the disposal of waste, e.g. by combustion, in larger units either operated or licensed by local authorities.

A 12735 02042, 03471, 05800

Robert, A.J.

FORUM: TWO PEOPLE AND ONE DUSTFALL JAR

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 646. (L)

Describes briefly how the responsibilities of the local Air Pollution Control Official in a municipality have grown over the years to their current status. The functions of such an official and the range of his contacts with other departments and officials are indicated.

## 6. Administration (programmes, standards, legislation)

A 12736 02045, 02461, 02914, 05800

U.S. Congress

STATUS OF ENVIRONMENTAL QUALITY LEGISLATIVE MEASURES

Envir. Sci. Technol., Oct. 1968, vol. 2, 755-758. (L)

A review of the activities of the second session of the 90th Congress of the U.S. shows that only a few measures have been promulgated to protect or enhance the quality of the environment in the U.S. Some data relating to the appropriation of funds are included.

A 12737 02043, 03103, 05800

" S. House of Representatives

ENVIRONMENTAL MANAGEMENT NEEDS LONG-RANGE PROGRAM

Envir. Sci. Technol., Aug. 1968, 596-601. (L)

Refers to a recent report, "Managing and Environment", issued by the House Subcommittee on Science, Research, and Development.

The report is a summary of current information on the general subjects of pollution control, ecology, and environmental quality. The report is based on testimony of witnesses from no less than 39 organizations at hearings held earlier this year.

Congress recognizes the problem of

environmental management. A glance at the number of newly introduced bills testifies to the fact. But the long range strategy is lacking, as pointed out by the report.

The report also notes that the problem which remains with us today is the translation of information into action.

A 12738 02044, 05850, 05854

U.S. Department of Health, Education, and Welfare, NAPCA

AIR REGION BOUNDARIES PROPOSED FOR CHICAGO

J. Air Pollut. Control Ass., Nov. 1968, vol. 18, 771. (L)

Commissioner John T. Middleton of the National Air Pollution Control Administration has proposed boundaries for an interstate air quality control region covering the Chicago metropolitan area.

The proposed region, described on September 27 in the Federal Register, includes the City of Chicago and adjacent areas of Illinois and Indiana.

The boundaries of the federally proposed region include Lake and Porter Counties in Indiana and the Counties of McHenry, Lake, Kane, Cook, DuPage, and Will in Illinois.

## 6. Administration (programmes, standards, legislation)

A 12739

02021, 02041, 03889

U.S. Public Health Service, Bureau of Health Manpower

THE RIGHT MAN FOR THE RIGHT JOB

Envir. Sci. Technol., Aug. 1968, vol. 2, 586-588. (L)

As the national environmental control program grows, it creates thousands of new jobs that require a wide range of training. A quarter million technicians and aides may be required by government and industry within 10 years, according to estimates of the Public Health Service's Bureau of Health Manpower. And these patterns should be changed to use even more technicians and aides in the opinion of Frederick K. Erickson, Deputy Director of the bureau's Division of Allied Health Manpower.

But changing these patterns will take time, one reason being that no one really knows what tasks are involved and what training is required to do them.

The Bureau of Health Manpower—along with PHS's Consumer Protection and Environmental Health Service—has just awarded a contract to the Pennsylvania Hospital and Educational Research Foundation (Harrisburg, Pa.) to start such a study.

A 12740

C2028, 02045, 02214, 02642, 03192, 05180

Wiethaup, H.  
THE (FEDERAL GERMAN) LAW RELATING TO PREVENTIVE MEASURES FOR KEEPING THE AIR CLEAN, OF 17.5.1965. (DAS GESETZ ÜBER VORSORGEMASSNAHMEN ZUR LUFTREINHALTUNG VOM 17.5.1965). (In German; English summary).

Staub, Dec. 1968, vol. 28, 522-525, 22 refs. (L)

The object of the Clean Air Law of 17.5.1965 (BGBl. I S.413) (Federal Law Paper I p.413) is to abate the increasing contamination of the air by control and survey of the emissions. These measures should enable conclusions to be drawn with regard to the type and concentration of substances emitted by different plants. Related legislation passed by the local regions in Federal Germany is discussed.

See also: A 12686, A 12715

## 7. Methods and equipment for abatement

A 12741 02030, 02043, 02490, 02613, 02614, 02625, 02691, 02715,  
02722, 03962

Annis, J.C.

PARTICLE STUDIES AT KANSAS STATE UNIVERSITY

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 693. (L)

The Fine Particle La' oratory is engaged in several particulate studies related to air pollution. An investigation of methods for improving the efficiency of cyclone collectors on alfalfa dust in the dehydration process has just been completed with the cooperation of the Department of Grain Science.

A second study, still in progress attacks the problem of predicting the efficiency of fibrous filters where particle bounce is a significant factor. This generally occurs where particles are larger than 5-10 microns, whether the filter fibers are adhesive-coated or not.

A 12742 02157, 02168, 02614, 02692, 02715  
Anon.

DUST COLLECTION AT CEILING BOARD MILL

(CIS)

"Heating and Ventilating Engineer", London,  
United Kingdom, May 1967, Vol. 40, No. 478, pp. 593-594. Illus.

This article describes the dust collection plant installed at an ultra-modern, semi-automated continuous-flow mineral fibre ceiling board mill (opened December 1965) in order to prevent atmospheric pollution either inside or outside the factory by dust from the manufacturing processes, particularly the shaping and sanding operations. The plant, which is illustrated and described, consists of two separate banks of 12 automatic self-cleaning bag type dust collectors which are cleaned in sequence without any interruption in production. The installation is compact and flexible, thus ensuring that a wide range of conditions can be accommodated. Reverse air purging assists clearance of obstinate dust particles from the filter medium. Hinged doors in the sides and top of each section facilitate inspection.

A 12743 02581, 03443, 03513, 03532, 03593, 03777  
Anon.

COOPERATIVE DEMONSTRATION PLANT TO REMOVE SULPHUR DIOXIDE

Chem. Week, 6 July 1968, vol. 103, 37. (L)

A cooperative demonstration plant to remove sulfur dioxide from stack gases will be built at Baltimore Gas & Electric Co.'s Charles P. Crane Electric Generating Plant in Baltimore County, Maryland. The plant, to cost \$1.5 million, will represent a collaborative effort by BG&E; Bechtel Corp. and its subsidiary, Wellman-Lord; Potomac Electric Power Co. and W.R. Grace. Engineering for the unit has been under way since April; plant completion is due by next April. It will be operated by Grace.

Objective: to prove practicality and economic feasibility of the Beckwell process, which scrubs flue gases to produce an anhydrous sulfur dioxide (and thus eliminates sulfur trioxide and fly ash pollutants). The process has been put through its paces for eight months in a pilot unit at Tampa

A 12743 (contd)

Electric Co.'s Gannon Station in Tampa. It proved 90-95% effective in removing the SO<sub>2</sub>.

## 7. Methods and equipment for abatement

A 12744 02080, 02461, 02681, 03532, 03777; 03513  
Anon.

TWO PROCESSES OFFER ECONOMIC RECOVERY OF STACK-GAS SO<sub>2</sub>

Chem. Engng News, 8 July 1968, 13. (L)

Economic recovery of stack-gas sulfur oxides was claimed for two processes at the 61st Annual Meeting of the Air Pollution Control Association in St. Paul, Minn. One process, financed by Slick Industrial Co. and developed at Southwest Research Institute, Houston, Tex., is a modification of the Bureau of Mines' alkalinized alumina process. The major change is use of sodium aluminate in place of alkalinized alumina. The change permits use of smaller equipment and saves materials handling costs because the aluminate is more efficient in removing sulfur dioxide from stack gases, Southwest

Research says.

For the other process—a molten carbonate process developed by North American Rockwell's Atomics International division (C&EN, Aug. 14, 1967, page 11)—quantitative economic data were presented which indicate that "sulfur recovery credits would probably offset operating costs." Both capital and operating costs for the molten carbonate process are lower than corresponding costs for the alkalinized alumina, catalytic oxidation, or Reinluft processes.

(contd.)

A 12744

(contd.)

Bench-scale tests of the molten carbonate process show greater than 99% removal of sulfur oxide from gas

streams containing between 0.3 and 3.0% sulfur dioxide, says Atomics International's project engineer Richard D. Oldenkamp.

A 12745 02237, 02461, 02681, 02971, 03064, 03532, 03779; 02001, 03513; 05942  
Anon.

TVA STUDYING METHODS FOR SULFUR OXIDES REMOVAL

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 705, 707. (L)

The Tennessee Valley Authority is carrying out for the National Air Pollution Control Administration a series of major conceptual design and cost studies on methods for removing sulfur oxides from power plant stack gases.

The first of these—on limestone injection into the power plant boiler to absorb sulfur oxides as waste calcium sulfate—has been completed. The report concludes that the method is the simplest of the various ones that have been proposed, and that investment and operating costs are relatively low. The efficiency, however, leaves much to be

desired; even if the several remaining technical problems can be worked out, probably only 50 per cent or so of the sulfur oxides can be removed with twice the theoretical amount of limestone—which is about as much extra dust loading as the boiler can tolerate.

In small-scale experimental work, TVA is studying several new methods for recovering the sulfur oxides in a useful form. Current emphasis is on absorption in alkali solutions—sodium, potassium, or ammonium—and regeneration of the alkali sulfite formed to give sulfuric acid or sulfur as the product.

(contd.)

A 12745

(contd.)

The results of the study will be used in planning forthcoming full-scale tests of limestone injection at the TVA Shawnee and Paradise power plants in Kentucky.

Several research groups—among them "N110GAZ" (USSR), Beckwell Process Corp. (associated with Wellman-Lord Inc., a subsidiary of Bechtel Corporation), and TVA—are now studying the approach to separating the sulfite as a

solid so that it can be regenerated with minimum energy requirement. N110GAZ adds magnesia to precipitate magnesium sulfite, Beckwell (according to a recent patent) cools to crystalline pyrosulfite, and TVA uses an alkali phosphate solution as the absorbent since pyrosulfite has low solubility in such a solution and crystallizes rapidly.

(TVA projects also covered in Envir. Sci. Technol., Nov. 1968, 994-7; cf. Abstract A 12746)

## 7. Methods and equipment for abatement

A 1 2 7 4 6 02001, 02084, 02333, 02681, 02786, 0291, 03064, 03312,  
03443, 03532, 03777, 03779, 05820

Anon.

SO<sub>2</sub> CONTROL PROCESSES FOR STACK GASES REACH COMMERCIAL STATUS

Envir. Sci. Technol., Nov. 1968, vol. 2, 994-997. (L)

The latest development in the fast-moving field of control of sulfur oxide from power plant flue gases is Monsanto's decision to offer commercially the catalytic oxidation process it has had under development since 1961. The process underwent a year's testing at a prototype plant at Metropolitan Edison's Portland, Pa., station.

The Monsanto move is one of a series of announcements over the past few months that may herald an advance in SO<sub>2</sub> control technology on a broad front. Among these moves:

Within a few days of the Monsanto announcement, Combustion Engineering, Inc., put on stream a sulfur oxides control unit at Union Electric's Meramec plant in South St. Louis County, Mo.; later this year, Kansas Power and Light will start a similar unit at Lawrence, Kan.

The Tennessee Valley Authority has just completed a design study, sponsored by the National Air Pollution Control Administration, of the dry limestone injection process. TVA will use the results of the study in planning

A 1 2 7 4 6 (contd)

full-scale tests by 1969 of the dry limestone process at its Shawnee and Paradise plants in Kentucky.

Last June, Wellman-Lord, Inc., announced plans for a 25 megawatt Clean Air Demonstration Plant in Baltimore County, Md., for evaluating its SO<sub>2</sub> control process. Cooperating with Wellman-Lord in the project are Baltimore Gas & Electric Co., Potomac Electric Power Co., and W. R. Grace & Co.

Stone & Webster Engineering Corp. and Ionics, Inc., have disclosed plans for a jointly developed process for SO<sub>2</sub> control that was field tested last year at Tampa Electric's Gannon station.

In addition to these processes, several other approaches have been undergoing evaluation—for example, the alkalinized alumina process for sulfur recovery which the Bureau of Mines is studying at a pilot plant in Bruceton, Pa. Recently, North American Rockwell's Atomics International Division and Princeton Chemical Research both disclosed plans for pilot scale evaluation of SO<sub>2</sub> control processes. North American's process uses molten carbonate as the SO<sub>2</sub> absorbant; Princeton Chemical's process features catalytic reaction of SO<sub>2</sub> with hydrogen sulfide. Both these processes recover elemental sulfur as byproduct.

A 1 2 7 4 7 02692, 03780, 02625, 02638, 02681, 02715, 02722, 02790,  
02954, 03181, 03607, 03879

Brink, J.A., Burgegrave, W.F., and Greenwell, L.E.

MIST ELIMINATORS FOR SULFURIC ACID PLANTS

Chem. Engng Prog., Nov. 1968, vol. 64, 82-86, 10 refs. (L)

Design and operating details on the use of fiber mist eliminators for cleaning up the stack gases of sulfuric acid plants. The elements described consist of fibers packed between two concentric screens. The mist particles collected on the surface of the fibers become part of the liquid film wetting the fibers. The liquid film moves downward by gravity through the fiber beds. The liquid drains down the inner screen to the bottom of the element and goes to a liquid seal pot, whence it is returned to the process. Good removal efficiencies are reported.

## 7. Methods and equipment for abatement

A 12748 02036, 02320, 02416, 02543, 02682, 02684, 03212, 03333,  
Bruselat, E. 03359, 03517

REDUCING THE CARBON MONOXIDE CONTENT OF THE EXHAUST GASES OF INTERNAL  
COMBUSTION ENGINES

British Patent 1,117,487, 19 June 1968 (Application: Germany, 18 Sept. 1964,  
3 Nov. 1964, 23 Feb. 1965), 7 pp. (L)

The CO content in the exhaust gases of an internal combustion engine is reduced by adding additional air to the fuel-air mixture entering the engine and then producing turbulent motion in the resulting mixture containing additional air. The amount of additional air is regulated by a control member linked to and cooperating with the fuel-air inlet throttle-valve in such a way that the amount of additional air increases as the throttle opening increases through a first part of its range, then reduces as the throttle opening increases through a second part of its range and no additional air is supplied with fully open throttle.

A 12749 02030, 02048, 02614, 03046, 03116, 03331, 03593, 03976,  
05810, 05814

Salvert, S. and Lurdgren, D.

PARTICLE COLLECTION IN A VENTURI SCRUBBER

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 677-678, 3 refs. (L)

A study is in progress which has as its object the determination of optimum conditions for efficient aerosol collection by various wet scrubber devices; variables being dust particle size, gas velocity, and liquid-to-gas flow rate. Samples of air were collected at specified sites in California and analysed in respect of the mass distribution/visibility relationship, and in respect of the size distribution and concentration of lead.

A 12750 02030, 02331, 02425, 02519, 02614, 02625, 02954, 03331

Cohen J.J. and Montan, D.N.

THEORETICAL CONSIDERATIONS, DESIGN, AND EVALUATION OF A CASCADE IMPACTOR  
(CIS)

"American Industrial Hygiene Association Journal", Detroit, Mich.  
USA, March-April 1967, Vol. 28, No. 2, pp. 95-104. Illus. 21 bibl. refs.

Using mathematical parameters of dust collection by impactors, the authors present an impactor performance prediction chart. From this chart, a cascade impactor of multi-jet, round-hole design was developed which provides easy alteration of impact stages and variation of air flow. The instrument was evaluated by empirical observation, correlation of mass distribution of aerosols as determined with the impactor and with membrane filter samplers, determination of stage efficiencies, and case loss studies. Generally, size distributions from mass determinations agreed well with those derived from microscopic sizing data. However, impactor analysis tended to yield larger values for standard deviation than did microscopic analysis.

A 12751 02030, 02043, 02684, 02960, 05814

Danielson, J.A. (ed.)

AIR POLLUTION ENGINEERING MANUAL

Washington: U.S. Public Health Service Publication 999-AP-40, 1967, 892 pp.,  
price \$5.75.

(Envir. Sci. Technol., Nov. 1968, vol. 2, 1048)

This manual is a comprehensive engineering guide to the application of practical technological techniques in the control of community air pollution in Los Angeles County, Calif. The 11 chapters, each by a different author, cover such topics as air contaminants; design of local exhaust systems; incineration; and control equipment for particulate matter.

## 7. Methods and equipment for abatement

A 12752 02033, 02333, 02513, 02684, 03312, 03359, 03968; 02320,  
Fitterer, A. & Sohn 02921, 03532; 03333

APPARATUS FOR DETOXICATING EXHAUST GASES OF INTERNAL COMBUSTION ENGINES  
British Patent 1,126,529, 5 Sept. 1966 (Application: Germany, 7 Sept. 1965),  
6 pp. (L)

Exhaust gases of internal combustion engines are detoxicated by after-burning and/or catalytic oxidation, in the presence of added fresh air, in an apparatus comprising two series-connected chambers: The first chamber contains an after-burning dev'ce with air supply or a perforated catalyst container, and the second chamber, which is connected with the first chamber by means of a Venturi nozzle, contains a gas-permeable catalyst in a container with perforated walls; the container(s) being fitted with an internal flow pipe of such cross-sectional area as to allow at least a part of the exhaust gases to pass through the pipe. This two-chamber system produces an injector nozzle action which counteracts any increase in back pressure or diminution of silencer action in the system.

A 12753 02683, 03234, 03593, 03739; 02787, 03315, 03777; 03333  
Koninklijke Nederlandse Hoogovens en Staalfabrieken N.V.  
PRODUCTION OF FLUE GAS HAVING A RELATIVELY LOW NO<sub>x</sub> CONTENT  
British Patent 1,080,240, 23 Aug. 1967 (Addition to Brit. Pat. 937,364)  
(Application: U.K. 16 Dec. 1964), 3 pp. (L)

Flue gas having a relatively low NO<sub>x</sub> content is produced by treatment with ozone at a pressure of not more than 6 atmospheres and then scrubbing the gas in order to remove the NO<sub>x</sub> formed. Preferably the ozone is introduced into the flue gas after SO<sub>2</sub> present in the flue gas has been removed therefrom by scrubbing with aq. sodium carbonate. The reduction in NO<sub>x</sub> content of the flue gas is in the range of by 90-95% of initial NO<sub>x</sub> content.

A 12754 02043, 02692, 03780; 02001, 02054, 02461, 02625, 02681,  
03593, 03777  
Kronseder, J.G.  
COST OF REDUCING SULFUR DIOXIDE EMISSIONS  
Chem. Engng Prog., Nov. 1968, vol. 64, 71-74, 7 refs. (L)

An economic analysis of the various available methods of reducing the sulfur dioxide content of stack gases from sulfuric acid plants to comply with increasingly stringent legal requirements. Based on the assumption of a plant with a capacity of 1,000 short tons of 100% sulfuric acid per day and 1968 construction costs, it is concluded that the scrubbing route is economically preferable to the double-absorption system.

A 12755 02002, 02681, 02915, 03107, 03639, 03777  
Li, K., Rothfus, R.R. and Adey, A.H.  
EFFECT OF MACROSCOPIC PROPERTIES OF MANGANESE OXIDES ON ABSORPTION OF SULFUR DIOXIDE  
Environ. Sci. Technol., Aug. 1968, vol. 2, 619-621, 3 refs. (L)

Four properties—bulk density, specific gravity, porosity, and surface area—of the manganese oxides, MnO<sub>2</sub> and  $\gamma$ -MnO<sub>2</sub>, affect their abilities to absorb SO<sub>2</sub> from simulated effluents containing 0.4% SO<sub>2</sub> and 5% N<sub>2</sub>. Surface area, specific gravity, and humidity strongly influence the absorptive capacities of the manganese oxides. Also, these absorption capacities increase with increasing surface area and decreasing specific gravity.

## 7. Methods and equipment for abatement

A 12756 02043, 02045, 05500; 02030, 02642, 02795, 03661; 02314,  
03976; 02461, 03775

Lord Kennet

CLEAN AIR - WHERE NOW?

Smokeless Air, summer 1968, vol. 38, (146), 228-233. (L)

Review, by the Joint Parliamentary Secretary, Ministry of Housing & Local Government, of the progress made so far in the maintenance of clean air in the U.K. Points mentioned include the reduction achieved in the incidence of poor visibility at London Airport, and the objects of the Private Member's Clean Air Bill (offering the first opportunity of legislative advance since introduction of the Clean Air Act of 1956). The provision of smokeless fuel by the National Coal Board is regarded as an important factor for air pollution abatement in the future.

A 12757 02009, 02030, 02343, 02390, 02722, 03607, 03652, 05400;  
Lutsch, P. 03333

WET SEPARATORS IN THE SOVIET UNION. (NASSABSCHEIDER IN DER SOWIETUNION)

Wass. Luft Betr., June 1968, vol. 12, 374-375. (L) (In German)

A brief, illustrated survey. A separator which is particularly suitable for removing acid vapours and aerosols from air (Russian patent 185,196) comprises orifices through which the air to be cleaned is sucked and is then contacted with water in turbulent motion; the resulting aqueous sludge formed by the dust particles is filtered off; immersion depth of orifice in water bath is critical for optimum performance. A similar type of apparatus has a telescopic air inlet which is self-adjusting for optimum depth of immersion in the water bath (Russian patent 175,811). A separator with multi-element filter is self-cleaning (Russian patent 169,992), while another type of separator is equipped with a centrifuge (Russian patent 168,100) for removing the solids from the sludge formed.

A 12758 02084, 02333, 02374, 02449, 02687, 03921, 03046, 03201,  
03312, 03953; 02684, 03359

Leak, R.J., Brandenburg, J.T. and Behrens, M.D.

USE OF ALUMINA-COATED FILAMENTS IN CATALYTIC MUFFLERS: TESTING WITH SINGLE-CYLINDER ENGINE

Envir. Sci. Technol., Oct. 1968, vol. 2, 787-789, 13 refs. (L)

A novel alumina-coated metal mesh structure was used as a support for catalytic agents for the oxidation of hydrocarbons in automotive exhaust gas. The filamentary catalyst structures were evaluated in the exhaust stream of a single cylinder engine. Copper chromite on the alumina-coated mesh had the highest initial activity, but vanadia on the same support had the best resistance to lead deactivation. Phosphate and chromate filters on the alumina-coated mesh were effective in trapping lead compounds and extending the life of the catalysts. The mesh with an adherent alumina coating had a much greater resistance to attrition in use than any conventional particulate form of catalyst.

## 7. Methods and equipment for abatement

A 12759 02033, 02084, 02320, 02333, 02374, 02449, 02616, 02682, 02684, 02921, 03109, 03201, 03207, 03268, 03359

Leak, R.J., Brandenburg, J.T. and Behrens, M.D.

USE OF ALUMINA-COATED FILAMENTS IN CATALYTIC MUFFLERS: TESTING WITH MULTI-CYLINDER ENGINE AND VEHICLES

Envir. Sci. Technol., Oct. 1968, vol. 2, 790-794, 7 refs. (L)

Catalytic mufflers with an alumina-coated filamentary structure were tested for oxidation of hydrocarbons and carbon monoxide in automotive exhaust. The catalytic mufflers were evaluated in combination with a manifold afterburner system, which warmed the catalysts rapidly and protected them from overheating. A dual catalyst system of vanadia plus copper chromite on alumina-coated steel wool had the highest activity and the best life characteristics. However copper chromite on the same structure was used for road tests because of superior odor of the treated gases and simplicity of preparation. After 12,000 miles of road use the

(contd)

A 12759 (contd)

mufflers were tested in the official California cycle. On two cars with large displacement engines the manifold afterburner plus catalytic muffler passed. On a compact car with a small engine displacement the system did not reduce emissions sufficiently, owing to high combustible concentrations and engine deterioration

A 12760 03532, 03777; 02683, 03593; 03333

Norddeutsche Affinerie

REMOVING SULPHUR DIOXIDE FROM GASES

British Patent 1,107,626, 27 March 1968 (Application: Germany, 18 June 1964) (L) 4 pp.

$\text{SO}_2$  is removed from gases by passing them in countercurrent through an aqueous solution of selenious acid in at least two stages, the selenium which is formed in the first stage being completely removed from the liquor circulating through this stage, and the  $\text{SO}_2$  being removed from the gas in the second stage. The first stage may be performed discontinuously, with circulation of the scrubbing acid until it is spent. In the final stage, which is preferably operated continuously, it is advisable to maintain a stoichiometric excess of selenious acid with respect to the  $\text{SO}_2$  in the reactor. Solid components are preferably removed from the gas to be cleaned before it enters the first stage, e.g. by electroprecipitation.

A 12761 02399, 02461, 02651, 03443, 07532, 03779

O'Brien, R.

COAL-FIRED PLANTS NOT DOOMED BY POLLUTION THREATS

Envir. Sci. Technol., Oct. 1968, vol. 2, 729. (L)

Added costs for pollution control equipment will not keep coal-fired electric power plants from remaining competitive with nuclear power generation, according to a National Coal Association spokesman. Brice O'Brien, NCA general counsel, told an NCA-Bituminous Coal Research, Inc., sales/research conference in Pittsburgh last month that the cost of  $\text{SO}_2$  removal, with currently available technology, would be equivalent to about one dollar per ton of coal used, or 0.38 mills per kWh. of electricity generated. In addition, cooling towers for thermal pollution control would add 0.12 mills per kWh. to coal plants, and 0.17 mills per kWh. to nuclear plants. Nevertheless, total typical generating costs for a 1000 megawatt coal plant would be 5.75 mills per kWh., compared with 5.79 mills for nuclear plant of the same capacity.

## 7. Methods and equipment for abatement

A 12762 02026, 02746, 02760, 02625, 03331, 03532, 03624; 02030,  
Pilney, J.P. and Erickson, E.E. 02722

FLUIDIZED BED FLY ASH FILTER

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 684-685. (L)

The effects on fly ash removal of the following variables were investigated: the particle size of the bed medium, fluidization characteristics of the bed medium, time of run (5 to 40 minutes), bed depth (0.5 to 2<sup>3/4</sup> inches), fly ash loadings of the fluidizing air (0.23 to 10.7 grains per cubic foot), superficial velocity (0.3 to 2.1 feet per second), and humidity of the fluidizing air. Also, the effect of the nature of the bed medium on fly ash removal was studied by using five different bed media: silica sand, agglomerated fly ash, aluminum silicate, polystyrene beads, and wax particles.

A 12763 02427, 02455, 02613, 02638  
Robinson, M.

THE EFFECT OF POLARITY ON PARTICLE CONCENTRATION PROFILES IN ELECTROSTATIC PRECIPITATORS

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 688-690, 11 refs. (L)

The present study is intended to explore in fuller detail the nature of the concentration profile at various electrical and flow conditions in a model precipitator.

The most striking finding of the work so far is the wholly unexpected influence of the discharge-electrode polarity on the shape of the profile.

A 12764 02333, 02416, 02425, 03137, 03312, 03456  
Thomas, N.T. and Nobe, K.

INTRAPARTICLE DIFFUSION IN THE CATALYTIC COMBUSTION OF METHANE, ETHANE, AND PROPANE

Envir. Sci. Technol., Aug. 1968, vol. 2, 622-627, 13 refs. (L)

The pellet size of the catalyst CuO-Al<sub>2</sub>O<sub>3</sub> affects the combustion of methane, ethane, and propane. Porous diffusion effects in the combustion of these gases are influenced by pellets of size 3.0 mm. x 2.5 mm., but are not by half-sized pellets. Good agreement between the calculated and experimental data of the larger size pellets was obtained by considering both surface diffusion and gas phase pore diffusion.

A 12765 02030, 02048, 02411, 02464, 02516, 02604, 02621, 02638,  
02722, 03331, 03380, 05120

Tomasides, M.

RECENT CZECHOSLOVAKIAN RESEARCH INTO PARTICLE COLLECTION

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 481. (L)

Work in this field is carried out chiefly at the Institute of Physical Chemistry of the Czechoslovakian Academy of Science in Prague by a group under K. Spurny, where the generation of radioactively labelled aerosols, the counting and sizing of aerosols by flame photometry, and the theory of filtration are under study, and at the Air and Gas Filtration and Dust Collection Laboratory of the Research Institute of Air Engineering in Prague, where the calculation of dust collection efficiency and improvements in electrostatic precipitators have received special attention.

## 7. Methods and equipment for abatement

A 12766

02043, 02046, 02386, 02964, 03201

U.S. Bureau of Mines

AIR POLLUTION: "Clearing the Air"

Pittsburgh: Publication Distribution Section, Bureau of Mines, 20 pp.

(Envir. Sci. Technol., Aug. 1968, vol. 2, 639)

"Clearing the Air" is a 20-page brochure describing the Bureau of Mines programs in air pollution abatement, including research on automotive exhaust, urban, and industrial pollution. Emphasis is placed on the waste of resources that pollution entails, and on the need for improved technology to minimize such waste.

A 12767

02390, 02461, 02964, 05600

U.S. Department of Commerce

DEPARTMENT OF COMMERCE REPORTS 1967 SALES OF INDUSTRIAL GAS CLEANING EQUIPMENT

J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 700. (L)

The Nation's concern over air pollution has increased the sales of industrial air pollution control equipment 100 per cent in the last five years, the U. S. Department of Commerce has reported.

The report covers equipment to remove gases and dry and liquid particles from industrial gaseous waste. It does not cover air conditioning and filtering equipment, or equipment to reduce air pollution by internal combustion engines.

See also: A 12657, A 12671, A 12676, A 12699, A 12697, A 12720, A 12724, A 12726, A 12727, A 12733, A 12734, A 12771

## 8. Miscellaneous

**A 12768** 02214, 02265  
Parper, R., Kate Smith, E.C. and Land, D.G.  
ODOUR DESCRIPTION AND ODOUR CLASSIFICATION. A Multidisciplinary Examination  
London: J.A. Churchill Ltd., 1968, 191 pp., price 38s. (L 99716)

Presents a critical examination of what is involved in odour description and odour classification, based upon the published literature. Over 200 refs. are given.

**A 12769** 02030, 02048, 02604, 02815, 03331  
Hendricks, C.D.  
UNIFORM PARTICLE SOURCES FOR POLLUTION RESEARCH  
J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 69-670. (L)

Reports the development of a technique, involving use of a moving jet of liquid (which may be a solution of a solid or melt of a solid, as well as a normally liquid material), by which both liquid and solid particles in the size range 0.01 micron to a few mm. radius may be produced.

**A 12770** 02030, 02035, 03061, 03259, 03351, 03567  
Kerker, M. and Matijevic, E.  
PREPARATION OF SUBMICRON AEROSOLS OF NARROW SIZE DISTRIBUTION AND THEIR ANALYSIS BY LIGHT SCATTERING  
J. Air Pollut. Control Ass., Oct. 1968, vol. 18, 665-667, 9 refs. (L)

The kinetics of coagulation, evaporation, and condensation of submicron aerosols, their scavenging by water drops, and analysis of particle size distribution by light scattering are subjects of studies at the Clarkson College of Technology, New York.

**A 12771** 02048, 05330  
Nordforsk (Scandinavian Council for Applied Research)  
RESEARCH PROJECTS IN SCANDINAVIA - Semiannual list no. 2/1968  
Helsinki: The Council, 1968. (Report available from State Institute for Technical Research, Helsinki 18); p.215-2 6. (P 12395)  
Grants were awarded in 1968 for the following research projects (*inter alia*) listed on p.219:  
*The Committee for Water, Air and Soil Pollution.*  
Investigation of environmental pollution. (TFR)

*Knud Hansen, overingenior.* Establishment of 2-3 measuring stations for air pollution as a link in an international net. (STVF)  
*The Institute for Water and Air Pollution Research.*  
The effect of different factors on the emission of odours in the combustion of black liquor. (TFR)

(contd)

**A 12771** (contd)  
*Pekka Mikola, prof.* Prevention of environmental pollution. (SITRA)

( SITRA      Memorial Year Fund of Finland's Independence 1967  
                 STVF      Danish Government Fund for Scientific and Industrial Research  
                 TFR      Swedish Council for Applied Research)